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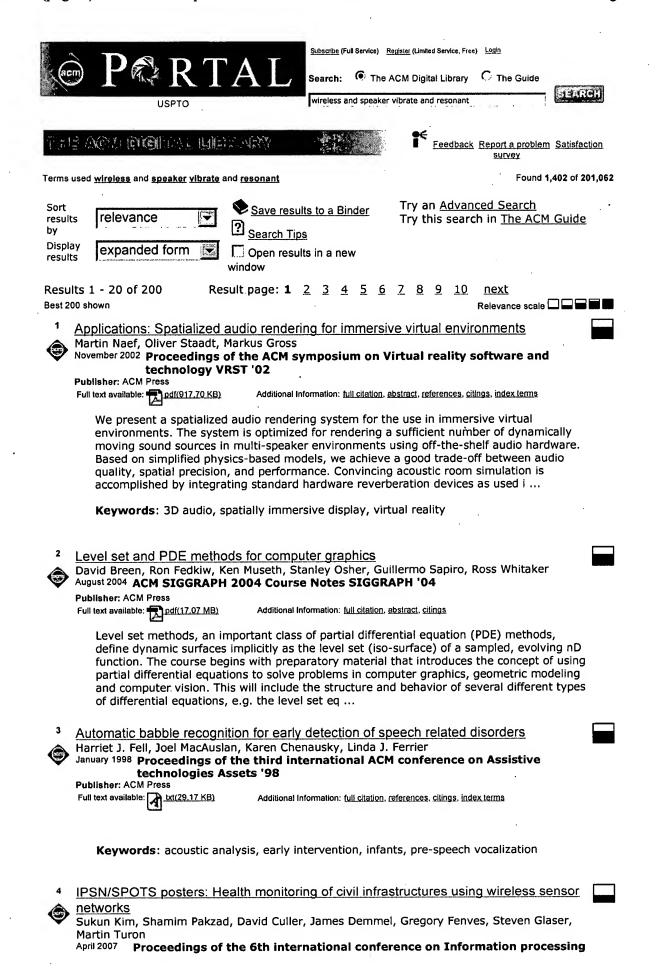
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Publisher: ACM Press

Full text available: pdf(1.01 MB)

Additional Information: full citation, abstract, references, index terms

A Wireless Sensor Network (WSN) for Structural Health Monitoring (SHM) is designed, implemented, deployed and tested on the 4200ft long main span and the south tower of the Golden Gate Bridge (GGB). Ambient structural vibrations are reliably measured at a low cost and without interfering with the operation of the bridge. Requirements that SHM imposes on WSN are identified and new solutions to meet these requirements are proposed and implemented. In the GGB deployment, 64 nodes are distributed ...

Keywords: deployment, large-scale, structural health monitoring, wireless sensor networks

Embedded technologies: High damping electrostatic system for vibration energy scavenging



G. Despesse, J. J. Chaillout, T. Jager, J. M. Léger, A. Vassilev, S. Basrour, B. Charlot October 2005 Proceedings of the 2005 joint conference on Smart objects and ambient intelligence: innovative context-aware services: usages and technologies sOc-EUSAI '05

Publisher: ACM Press

Full text available: pdf(148.36 KB)

Additional Information: full citation, abstract, references

Advances in low power electronics and microsystems design open up the possibility to power small wireless sensor nodes thanks to energy scavenging techniques. Among the potential energy sources, we have focused on mechanical surrounding vibrations. To convert vibrations into electrical power we have chosen mechanical structures based on electrostatic transduction. Thanks to measurements and in agreement with recent studies [1], we have observed that most of surrounding mechanical vibrations occu ...

IPSN/SPOTS posters: Active sensing platform for wireless structural health monitoring D. Musiani, K. Lin, T. Simunic Rosing



Proceedings of the 6th international conference on Information processing in sensor networks IPSN '07

Publisher: ACM Press

Full text available: pdf(1.72 MB)

Additional Information: full citation, abstract, references, index terms

This paper presents SHiMmer, a wireless platform for sensing and actuation that combines localized processing with energy harvesting to provide long-lived structural health monitoring. The life-cycle of the node is significantly extended by the use of supercapacitors for energy storage instead of batteries. During this period the node is expected to work completely maintenance-free. The node is capable of harvesting up to 780J per day. This makes it completely self-sufficient while employed ...

Keywords: actuation, energy harvesting, low power, sensing, wireless

Work-in-progress: Supporting children's rhythm learning using vibration devices Sosuke Miura, Masanori Sugimoto



April 2006 CHI '06 extended abstracts on Human factors in computing systems CHI '06

Publisher: ACM Press

Full text available: pdf(884.92 KB)

Additional Information: full citation, abstract, references, index terms

In this paper, a rhythm instruction tool for school children using vibration devices is discussed. The proposed system called T-RHYTHM is for supporting individual children in playing musical instruments or singing, in solo or ensemble situations. T-RHYTHM provides each child with rhythm patterns of musical pieces through tactile senses, and supports her so that she can recognize her own rhythm without being confused by other children's performances or singing voices. The rhythm of the music giv ...

Keywords: children, rhythm learning, vibration device

Energy-efficient platform designs for real-world wireless sensing applications P. H. Chou, Chulsung Park

May 2005 Proceedings of the 2005 IEEE/ACM International conference on Computer-

aided design ICCAD '05

Publisher: IEEE Computer Society

Full text available: pdf(439.17 KB)

Additional Information: full citation, abstract

Real-world wireless sensing applications demand system platforms with a wide range of size, cost, power consumption, connectivity, performance, and flexibility requirements. These goals cannot be achieved without understanding the nature of the sensing functions in the first place, which can be classified into passive vs. active sensing, event detection vs. data acquisition, and real-time monitoring vs. data logging. This paper discusses platform design techniques for supporting these design goa ...

Section 06: objects in space: ComTouch: design of a vibrotactile communication



Angela Chang, Sile O'Modhrain, Rob Jacob, Eric Gunther, Hiroshi Ishii

June 2002 Proceedings of the conference on Designing interactive systems: processes, practices, methods, and techniques DIS '02

Publisher: ACM Press

Full text available: pdf(4.16 MB)

Additional Information: full citation, abstract, references, citings, index terms

We describe the design of ComTouch, a device that augments remote voice communication with touch, by converting hand pressure into vibrational intensity between users in real-time. The goal of this work is to enrich inter-personal communication by complementing voice with a tactile channel. We present preliminary user studies performed on 24 people to observe possible uses of the tactile channel when used in conjunction with audio. By recording and examining both audio and tactile data, we found ...

Keywords: communication, haptic interpersonal, remote communication, tactile communication, tangible telepresence, tangible user interface, touch-vibration mapping, vibrotactile

Unconventional human computer interfaces



Steffi Beckhaus, Ernst Kruijff

August 2004 ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04

Publisher: ACM Press

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This course focuses on how we can use the potential of the human body in experimental or unconventional interface techniques. It explores the biological or physiological characteristics of the separate parts of the body, from head to toe, and from skin to heart, showing how their sensor (input) and control (output) capabilities can be applied to human computer interfaces. We demonstrate a wide variety of applications that make use proven interfaces as well as extremely experimental systems. Exam ...

Vibration-to-electric energy conversion



Scott Meninger, Jose Oscar Mur-Miranda, Rajeevan Amirtharajah, Anantha Chandrakasan, Jeffrey Lang

August 1999 Proceedings of the 1999 international symposium on Low power electronics and design ISLPED '99

Publisher: ACM Press

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Keywords: MEMS, energy conversion, low-power, self-powered

Low power systems for wireless microsensors

K. Bult, A. Burstein, D. Chang, M. Dong, M. Fielding, E. Kruglick, J. Ho, F. Lin, T. Lin, W. Kaiser, H. Marcy, R. Mukai, P. Nelson, F. Newburg, K. Pister, G. Pottie, H. Sanchez, O. Stafsudd, K. Tan, S. Xue, J. Yao

August 1996 Proceedings of the 1996 international symposium on Low power electronics and design ISLPED '96

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	Keywords: 60 GHz radios, 8	02.11n, ultra-wideband (UWB)	
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16	Khalil Najafi August 2000 Proceedings of the 2 electronics and designate and actuations in the defense. Design of low-power sensors and actuators in compower microinstruments has a keywords: MEMS, energy has sources Hardware platforms: A platform domestic environments Joshua Lifton, Mark Feldmeier, Ya April 2007 Proceedings of the 6 in sensor networks 1 Publisher: ACM Press Full text available: pdf(5.53 MB) In this paper, we introduce the platform ideally suited to brow The backbone of the Plug sensor	Additional Information: full citation, abstract, references, index terms and Micro Electro Mechanical Systems (MEMS) have made highly accurate and portable sensors and instrument for a health care, industrial, consumer products, avionics, and recircuits for these applications, and use of micromachined abination with integrated circuits to implement even lower now become possible and the focus of at arvesting, low-power, micromachining, microsystems, power memory for ubiquitous sensor deployment in occupational and assuhiro Ono, Cameron Lewis, Joseph A. Paradiso assuhiro Ono, Cameron Lewis, Joseph A. Paradiso ashiro Ono, Cameron Lewis, Inseph A. Paradiso ashiro Ono, Cameron Lewis, Joseph A. Paradiso ashiro Ono, Cameron Lewis, Inseph A. Paradiso ashiro Ono (Cameron Lewis, Inseph A. Paradiso ashiro Ono, Cameron Lewis, Inseph A. Paradiso	

60Hz electrical outlets; surge protector circuit; s ...

Pen computing: a technology overview and a vision



ACM SIGCHI Bulletin, Volume 27 Issue 3

Publisher: ACM Press

Full text available: pdf(5,14 MB)

Additional Information: full citation, abstract, citings, index terms

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions. Starting with a short historic ...

SPOTS track: Experiences and directions in pushpin computing

Joshua Lifton, Michael Broxton, Joseph A. Paradiso

Proceedings of the 4th international symposium on Information processing in sensor networks IPSN '05

Publisher: IEEE Press

Full text available: pdf(496.79 KB)

Additional Information: full citation, abstract, references

Over the last three years we have built and experimented with the Pushpin Computing wireless sensor network platform. The Pushpin platform is a tabletop multihop wireless sensor network testbed comprised of 100 nodes arbitrarily placed within a one-squaremeter area. The Pushpin platform's concise form factor and extreme node density allow for fine-grained control of its environment and immediate user interaction, thereby uniquely situating it between simulated and real world sensor networks. Th ...

Late breaking results: short papers: Audio-haptic feedback in mobile phones



Angela Chang, Conor O'Sullivan April 2005

CHI '05 extended abstracts on Human factors in computing systems CHI '05

Publisher: ACM Press

Full text available: pdf(445.51 KB)

Additional Information: full citation, abstract, references, citings, index terms

A new breed of mobile phones has been designed to enable concurrent vibration and audio stimulation, or audio-haptics. This paper aims to share techniques for creating and optimizing audio-haptic effects to enhance the user interface. The authors present audio manipulation techniques specific to the multifunction transducer (MFT) technology. In particular two techniques, the Haptic Inheritance and Synthesis and Matching methods are discussed. These two methods of haptic media generation al ...

Keywords: MFTs, audio, audio-haptics, design research, haptic inheritance, haptics, sensorialism, synthesis and matching

Embedded tutorial 4: Design and power management of energy harvesting embedded



<u>systems</u>

Vijay Raghunathan, Pai H. Chou

October 2006 Proceedings of the 2006 international symposium on Low power electronics and design ISLPED '06

Publisher: ACM Press

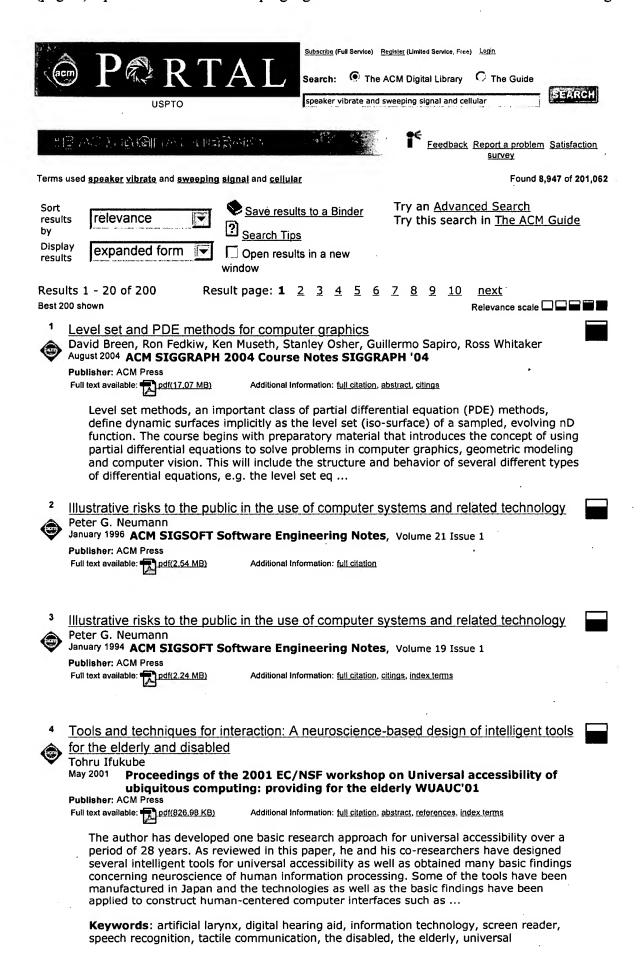
Full text available: pdf(78.84 KB)

Additional Information: full citation, abstract, references, index terms

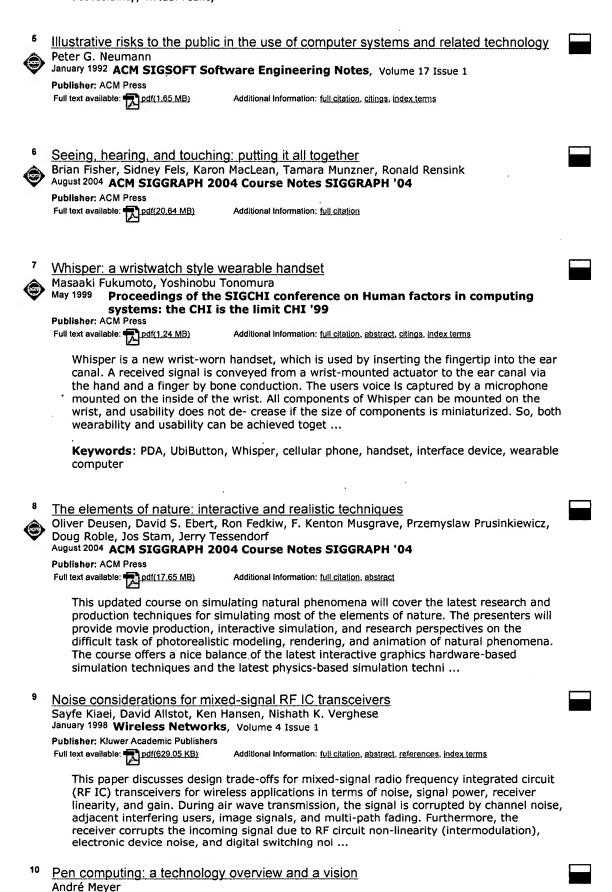
Harvesting energy from the environment is a desirable and increasingly important capability in several emerging applications of embedded systems such as sensor networks, biomedical implants, etc. While energy harvesting has the potential to enable nearperpetual system operation, designing an efficient energy harvesting system that actually realizes this potential requires an in-depth understanding of several complex tradeoffs. These tradeoffs arise due to the interaction of numerous fact ...

Keywords: energy harvesting, power management, solar power, wireless sensors

Results 1 - 20 of 200 Result page: 1 2 3 4 5 6 7 8 9 10



accessibility, virtual reality





July 1995 ACM SIGCHI Bulletin, Volume 27 Issue 3

Publisher: ACM Press

Full text available: pdf(5,14 MB)

Additional Information: full citation, abstract, citings, index terms

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions. Starting with a short historic ...

11 Interaction in the real world: Ambient touch: designing tactile interfaces for handheld



Ivan Poupyrev, Shigeaki Maruyama, Jun Rekimoto

October 2002 Proceedings of the 15th annual ACM symposium on User interface software and technology UIST '02

Publisher: ACM Press

Full text available: pdf(3.71 MB)

Additional Information: full citation, abstract, references, citings, index terms

This paper investigates the sense of touch as a channel for communicating with miniature handheld devices. We embedded a PDA with a TouchEngine™ --- a thin, miniature lower-power tactile actuator that we have designed specifically to use in mobile interfaces (Figure 1). Unlike previous tactile actuators, the TouchEngine is a universal tactile display that can produce a wide variety of tactile feelings from simple clicks to complex vibrotactile patterns. Using the TouchEngine, we bega ...

Keywords: mobile devices and interfaces, tactile feedback

12 Oral II: New pen device for biometrical 3D pressure analysis of handwritten



characters, words and signatures

Christian Hook, Juergen Kempf, Georg Scharfenberg

November 2003 Proceedings of the 2003 ACM SIGMM workshop on Biometrics methods

and applications WBMA '03

Publisher: ACM Press

Full text available: pdf(593.61 KB)

Additional Information: full citation, abstract, references, index terms

The demand for biometric applications in security, human computer interaction and related areas is rapidly increasing. This paper presents an unique biometrical smart pen BiSP for personal identification and handwriting recognition that has been developed in our laboratory. The system is superior to many other biometric techniques which have considerable disadvantages in practice. Several ballpoint like prototypes based on integrated sensors have been designed and constructed. In this report we ...

Keywords: acoustic handwriting recognition, biometric identification, microphone pen, multimodal biometrics, pen-pressure analysis, signature verification

¹³ Applications: Spatialized audio rendering for immersive virtual environments



Martin Naef, Oliver Staadt, Markus Gross

November 2002 Proceedings of the ACM symposium on Virtual reality software and technology VRST '02

Publisher: ACM Press

Full text available: pdf(917.70 KB)

Additional Information: full citation, abstract, references, citings, index terms

We present a spatialized audio rendering system for the use in immersive virtual environments. The system is optimized for rendering a sufficient number of dynamically moving sound sources in multi-speaker environments using off-the-shelf audio hardware. Based on simplified physics-based models, we achieve a good trade-off between audio quality, spatial precision, and performance. Convincing acoustic room simulation is accomplished by integrating standard hardware reverberation devices as used i ...

Keywords: 3D audio, spatially immersive display, virtual reality

Social weight: designing to minimise the social consequences arising from technology use by the mobile professional



Aaron Toney, Barrie Mulley, Bruce H. Thomas, Wayne Piekarski October 2003 Personal and Ubiquitous Computing, Volume 7 Issue 5

Publisher: Springer-Verlag

Full text available: pdf(431,74 KB)

Additional Information: full citation, abstract, citings, index terms

This paper defines the concept of social weight as a design consideration and presents the e-SUIT, a social weight research platform incorporated covertly within a traditional business suit. The e-SUIT allows its user to strike a balance between a given technology's derived benefit and its social consequence. As the e-SUIT is designed for research within a business context, it is built upon commercially available enterprise software. This work is a first step towards subjecting the empirical soc ...

Keywords: Mobile professional, Social weight, Wearable

GPGPU: general purpose computation on graphics hardware

David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn

August 2004 ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04

Publisher: ACM Press

Full text available: pdf(63.03 MB)

Additional Information: full citation, abstract, citings

The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

16 A mobile pet wearable computer and mixed reality system for human-poultry interaction through the internet

Ping Lee, David Cheok, Soon James, Lyn Debra, Wen Jie, Wang Chuang, Farzam Farbiz July 2006 Personal and Ubiquitous Computing, Volume 10 Issue 5

Publisher: Springer-Verlag

Full text available: pdf(809.99 KB)

Additional Information: full citation, abstract

Poultry are one of the most badly treated animals in the modern world. It has been shown that they have high levels of both cognition and feelings and as a result there has been a recent trend of promoting poultry welfare. There is also a tradition of keeping poultry as pets in some parts of the world. However, in modern cities and societies, it is often difficult to maintain contact with pets, particularly for office workers. We propose and describe a novel cybernetics system to use mobile and ...

Keywords: Cybernetics, Haptic interfaces, Mixed reality, Mobile computing, Multimodal interaction, Wearable devices

In-network processing: Capturing high-frequency phenomena using a bandwidth-



limited sensor network

Ben Greenstein, Christopher Mar, Alex Pesterev, Shahin Farshchi, Eddie Kohler, Jack Judy, Deborah Estrin

October 2006 Proceedings of the 4th international conference on Embedded networked sensor systems SenSys '06

Publisher: ACM Press

Full text available: pdf(853.96 KB)

Additional Information: full citation, abstract, references, index terms

Small-form-factor, low-power wireless sensors-motes-are convenient to deploy, but lack the bandwidth to capture and transmit raw high-frequency data, such as human voices or neural signals, in real time. Local filtering can help, but we show that the right filter settings depend on changing ambient conditions and network effects such as congestion, which makes them dynamic and unpredictable. Mote collection systems for high-frequency data must support iteratively-tuned, deployment-specific filte ...

Keywords: acoustics, health monitoring, motes, sensor networks, signal processing frameworks

Collision warning design to mitigate driver distraction



John D. Lee, Joshua D. Hoffman, Elizabeth Hayes

Proceedings of the SIGCHI conference on Human factors in computing systems CHI '04

Publisher: ACM Press

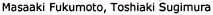
Full text available: pdf(299.61 KB)

Additional Information: full citation, abstract, references, citings, index terms

As computers and other information technology move into cars and trucks, distraction-related crashes are likely to become an important problem. This paper begins to address this problem by examining how alert strategy (graded and single-stage) and alert modality (haptic and auditory) affect how well collision warning systems mitigate distraction and direct drivers attention to the car ahead when it unexpectedly brakes. We conducted two experiments in which drivers interacted with an in-vehicle e ...

Keywords: collision warning systems, distraction, notification systems, smart cars, trust, user acceptance

19 Interactive posters: mobility: Active click: tactile feedback for touch panels



March 2001 CHI '01 extended abstracts on Human factors in computing systems CHI '01

Publisher: ACM Press

Full text available: pdf(149.94 KB)

Additional Information: full citation, abstract, references, citings, index terms

"Active Click" is a new interface mechanism for addling tactile feedback to touch panels. A small actuator is attached to a body of PDA or the backside of a touch panel. The tactile feedback, created by driving the actuator with a short pulse, is perceived by the grasping hand or tapping finger-tip when the panel is tapped. Active Click is effective in improving the input speed of touch panel operation especially in noisy situations. Active click is also useful for large touch panel devices such ...

Keywords: PDA, click, interface device, touch panel

²⁰ IC Design Challenges for Ambient Intelligence

Emile Aarts, Raf Roovers

March 2003 Proceedings of the conference on Design, Automation and Test in Europe - Volume 1 DATE '03

Publisher: IEEE Computer Society

Full text available:



Additional Information: full citation, abstract, citings, index terms

Publisher Site

The vision of Ambient Intelligence opens a world of unprecedente experiences: the interaction of people with electronic devices is changed as contextual awareness, natural interfaces and ubiquitous availability of information are realized. We analyze the consequences of the ambient intelligence vision for electronic devices by mapping the involved technologies on a power-information graph. Based on the differences in power consumption, three types of devices are introduce: the autonomous or micr ...

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